

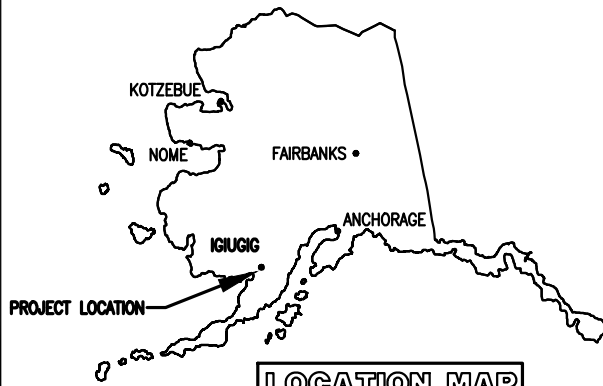
ADJACENT PROPERTY OWNERS: VILLAGE OF IGIUGIG,  
LAND HELD IN TRUST THROUGH MUNICIPAL LAND  
TRUST PROGRAM.

NO FILL MATERIAL REQUIRED. NO WETLANDS UTILIZED.

BLUE LINES REPRESENT THALWEG (MAIN CHANNEL)

RED OBJECTS REPRESENT HYPOTHETICAL LOCATIONS  
FOR RISEC TURBINES SHOWING SCALE. THE LARGER  
PORTION (DOWNSTREAM) REPRESENTS THE MAXIMUM  
FOOTPRINT OF THE DEVICE (45 FT), AND THE  
SMALLER PORTION (UPSTREAM) REPRESENTS THE  
ANCHOR (150 FT AHEAD OF DEVICE).

SHADED AREA RESERVED FOR TURBINE DEPLOYMENTS.

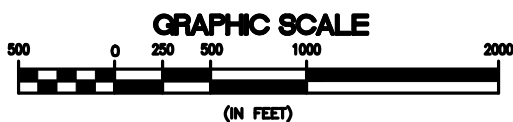


SECTIONS 08, T010S, R039W  
SEWARD MERIDIAN

LAT: 59°33' NORTH  
LONG: 155°89' WEST



**1** OVERALL PROJECT AREA SITE PLAN  
**SH1** 1"=1000'



PURPOSE:	<b>KVICHAH RIVER RISEC PROJECT SITE DESCRIPTION</b>		
WATERBODY:	<b>KVICHAH RIVER</b>		
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>		
PREPARED BY:	ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE: <b>3/16/12</b>	SHEET <b>SH1</b> of 3

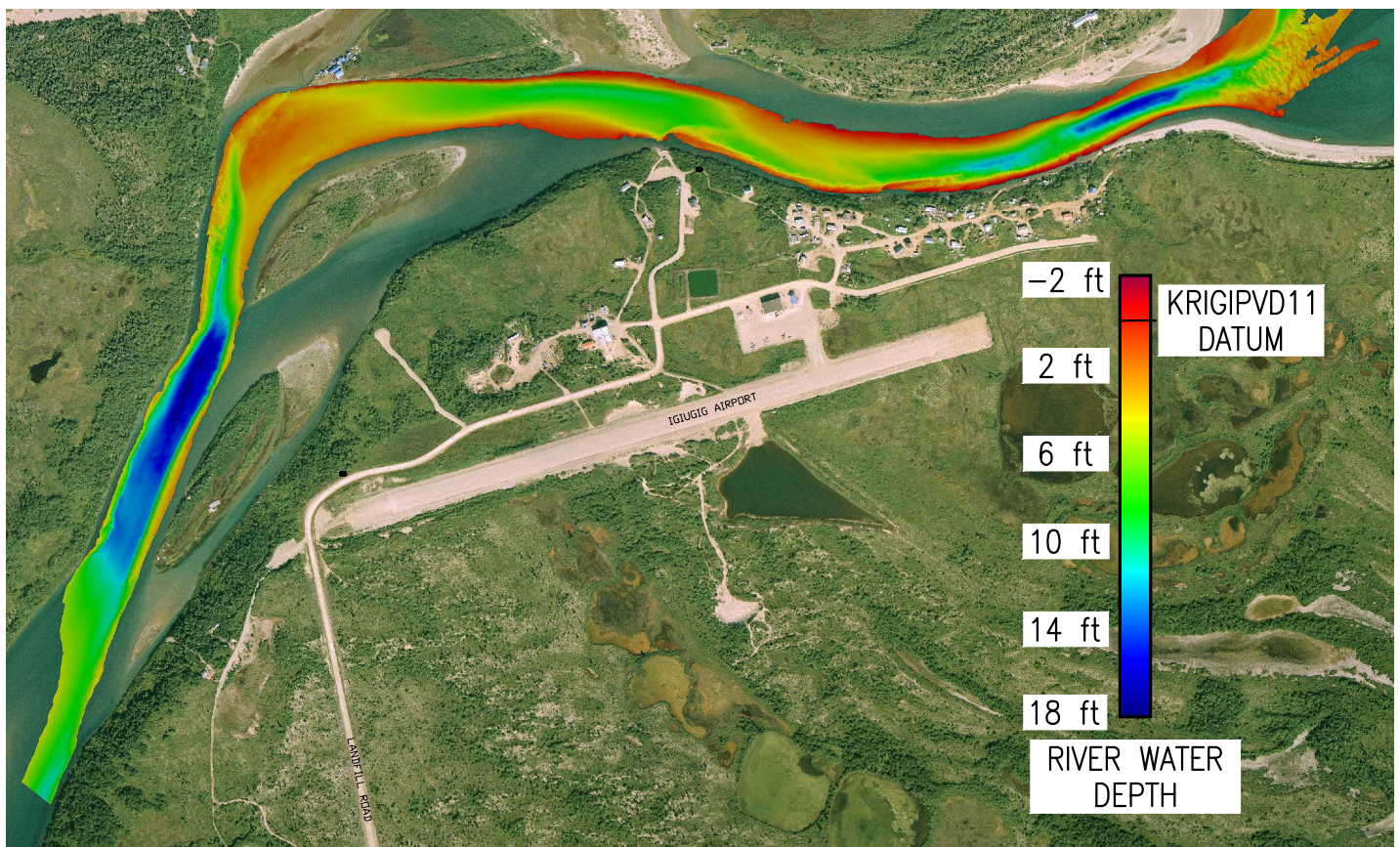


## NOTES

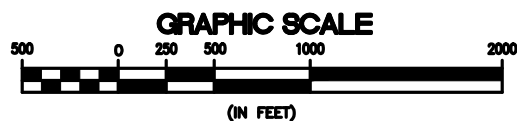
FOR FURTHER INFORMATION ON BATHYMETRY AND ADCP DATA COLLECTED DURING 2011, SEE FINAL REPORT PRODUCED BY TERRASOND LLD, DEC 9, 2011, TITLED KVICHAK RIVER RISEC PROJECT RESOURCE RECONNAISSANCE & PHYSICAL CHARACTERIZATION

DATA COLLECTION WAS RESTRICTED TO THE MAIN THALWEG (MAIN CHANNEL) AND THEREFORE DID NOT CONSIDER AREAS WHICH WERE VERY SHALLOW.

KRIGIPVD11 DATUM WAS ESTABLISHED BELOW THE LOWEST RECORDED WATER LEVEL. THEREFORE CAN BE CONSIDERED TO BE A WORST CASE SCENARIO WHEN COMPARING DEVICE SIZE RELATIVE TO RIVER DEPTH.



1 KVICHAK RIVER BATHYMETRY  
SH2 1"=1000'



PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>		
WATERBODY:	<b>KVICHAK RIVER</b>		
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>		
PREPARED BY:	ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE:	3/16/12
		SHEET	SH2 of 9

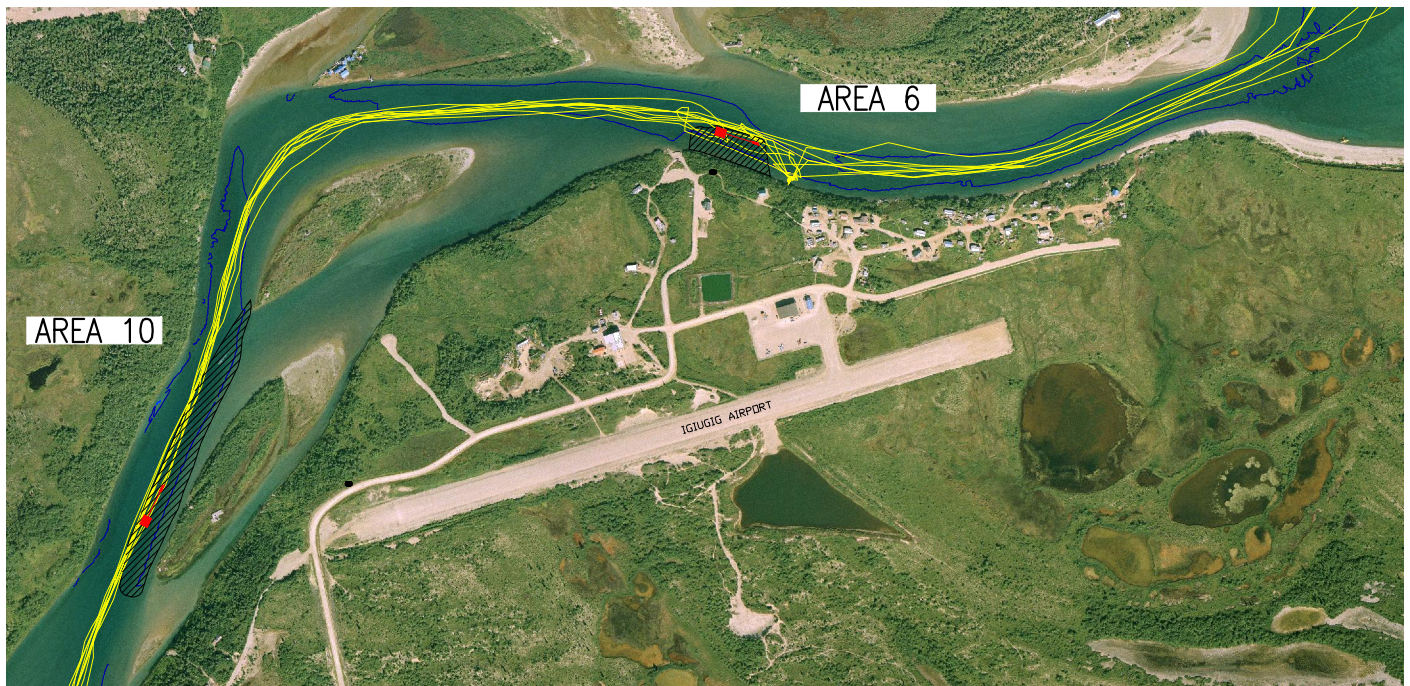


## NOTES

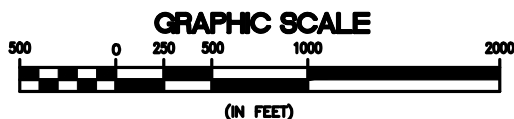
YELLOW LINES REPRESENT ACTUAL GPS RECORDINGS COLLECTED BY PACIFIC FISHING ASSETS, WHO ARE CONTRACTED TO BRING FUEL TO IGIUGIG AND OTHER COMMUNITIES UPSTREAM OF THE PROJECT AREA. THE FUEL BARGE CAN BE AS LONG AS 250 FT. THE FUEL BARGE IS ONLY ABLE TO TRAVEL TO IGIUGIG IN HIGH WATER (FALL), AND MAKES BETWEEN 6 AND 10 TRIPS PER SEASON.

THE PROJECT HAS RECEIVED A LETTER OF COMMITMENT FROM PACIFIC FISHING ASSETS TO SUPPORT THE PROJECT OCCUPYING THE SPACE DESCRIBED; GIVEN THE FOLLOWING CONSIDERATIONS.

1. RISEC DEVICE(S) DEPLOYED IN PROJECT AREA 6 WILL BE REMOVED, AND ANCHOR LINES REMOVED OR RETRACTED DURING FUEL BARGE ARRIVAL, DELIVERY, AND DEPARTURE.
2. RISEC DEVICE(S) AND ANCHORS, WHETHER LOCATED ON THE SURFACE OR SUBSURFACE, WILL BE CLEARLY MARKED TO AID THE BARGE CAPTAIN IN AVOIDING COLLISION.
3. TRAFFIC ROUTES WHICH CROSS THE AREA 10 BOUNDARIES DO SO OUT OF CONVENIENCE RATHER THAN NECESSITY. THEREFORE FUTURE BARGE TRAFFIC WILL NOT BE INHIBITED.
4. IN THE EVENT A RISEC DEVICE(S) IS DEPLOYED OUTSIDE THE DESCRIBED BOUNDARIES, OR IT IS DETERMINED THAT THE AREA AS CURRENTLY DEFINED IS NOT NAVIGABLE, FUEL BARGE TRAFFIC SHALL HAVE THE RIGHT OF WAY, AND THE DEVICE(S) SHALL BE MOVED.



1 NAVIGATION MAP  
SH3 1" = 1000'



PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>		
WATERBODY:	<b>KVICHAK RIVER</b>		
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>		
PREPARED BY:	ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE: 3/16/12	SHEET SH3 of 9



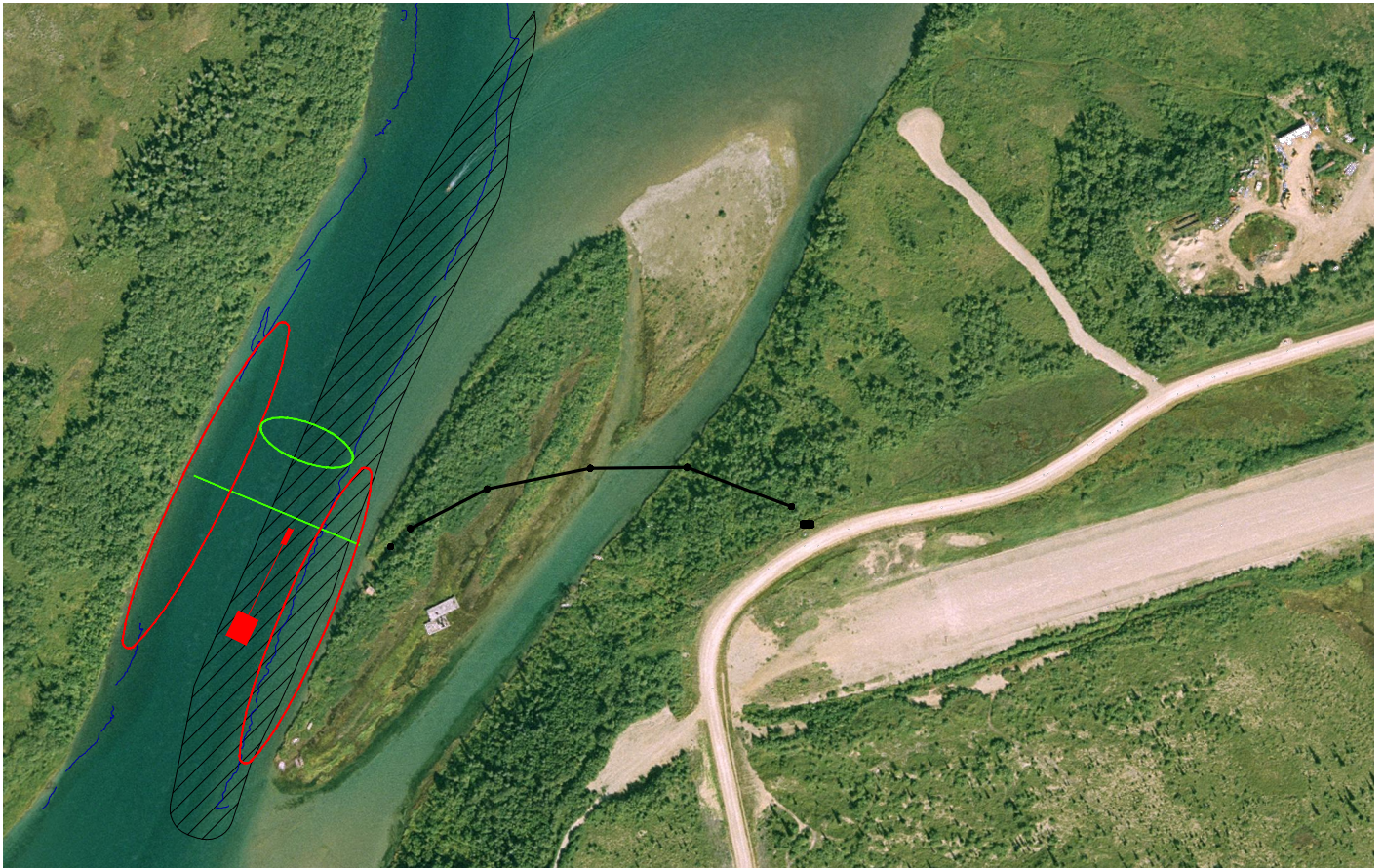
## NOTES

BLUE LINES REPRESENTS THALWEG (MAIN CHANNEL), SHADED AREA REPRESENTS AREA RESERVED FOR POTENTIAL DEPLOYMENTS OF RISEC DEVICE(S), DOWNSTREAM PORTION OF RED DEVICE REPRESENTS DEVICE (45 FT MAX WIDTH), UPSTREAM PORTION OF RED DEVICE REPRESENTS ANCHOR 150 FT AHEAD OF DEVICE.

SEGMENTED LINE REACHING FROM THE ISLAND BACK TO THE SHORE REPRESENTS POTENTIAL ROUTE FOR TEMPORARY OVERHEAD ELECTRICAL DISTRIBUTION CABLE.

RED OVALS REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION. GREEN OVAL REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION. GREEN LINE REPRESENTS APPROXIMATE LOCATION OF THE BRISTOL BAY SCIENCE AND RESEARCH INSTITUTE SMOLT PROGRAM CONDUCTED IN 2009.

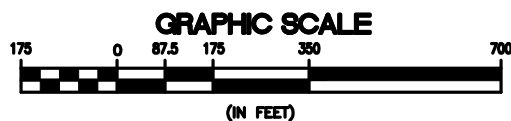
FOR MORE INFORMATION ON SPECIFIC BIOLOGICAL CONCERNS, REFER TO TO THE BIOLOGICAL ASSESSMENT AND MONITORING PLAN CONDUCTED BY LGL ALASKA ASSOCIATES.



1  
SH4

AREA 10 DETAIL

1" = 350'



PURPOSE: **KVICHAK RIVER RISEC PROJECT  
SITE DESCRIPTION**

WATERBODY: **KVICHAK RIVER**

LOCATION: **IGIUGIG  
LAKE AND PENINSULA BOROUGH**

PREPARED BY:  
**ALASKA ENERGY AND ENGINEERING, INC**  
P.O. BOX 111405  
ANCHORAGE, ALASKA 99511-1405

DATE:  
**3/16/12**

SHEET  
**SH4 of 9**



## NOTES

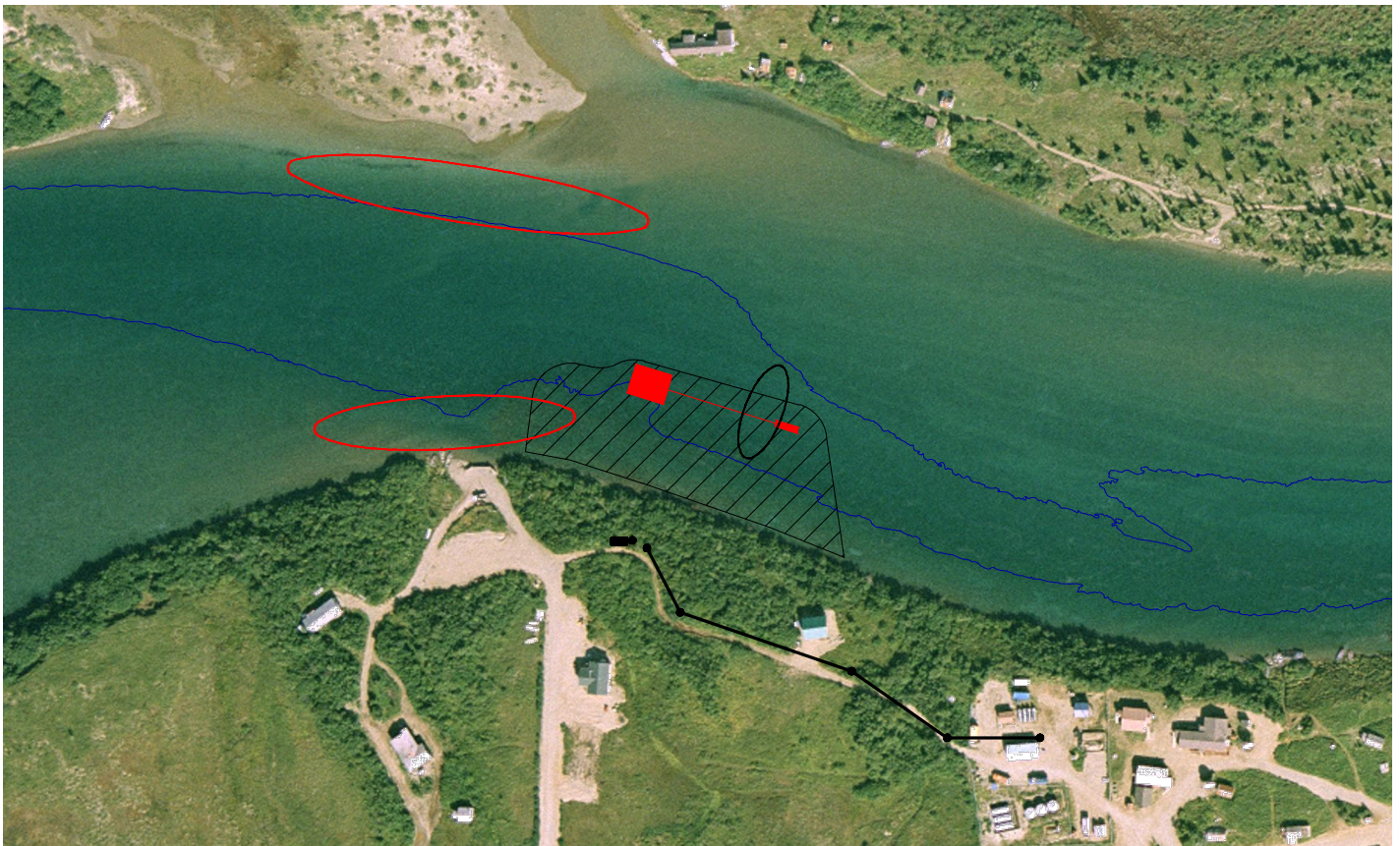
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SEGMENTED LINE REACHING FROM NEAR THE SHORE TO THE POWER PLANT REPRESENTS POTENTIAL ROUTE FOR TEMPORARY OVERHEAD ELECTRICAL DISTRIBUTION CABLE.

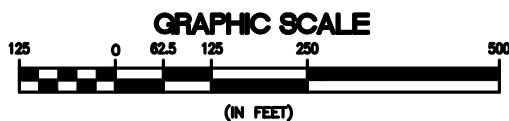
RED OVALS REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION. GREEN OVAL REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION.

FOR MORE INFORMATION ON SPECIFIC BIOLOGICAL CONCERNS, REFER TO THE BIOLOGICAL ASSESSMENT AND MONITORING PLAN CONDUCTED BY LGL ALASKA ASSOCIATES.

DEVICE(S) DEPLOYED IN AREA 6 WILL BE REMOVED DURING FUEL BARGE ARRIVAL, DELIVERY AND DEPARTURE.



1  
SH5 AREA 6 DETAIL  
1" = 250'



PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>		
WATERBODY:	<b>KVICHAK RIVER</b>		
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>		
PREPARED BY:	ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE:	3/16/12
		SHEET	SH5 of 9

## NOTES

LOW WATER OCCURS DURING SPRING, HIGH WATER OCCURS DURING FALL.

THE CROSS SECTION SHOWN BELOW DOES NOT SHOW THE BATHYMETRY TO EITHER SHORE.

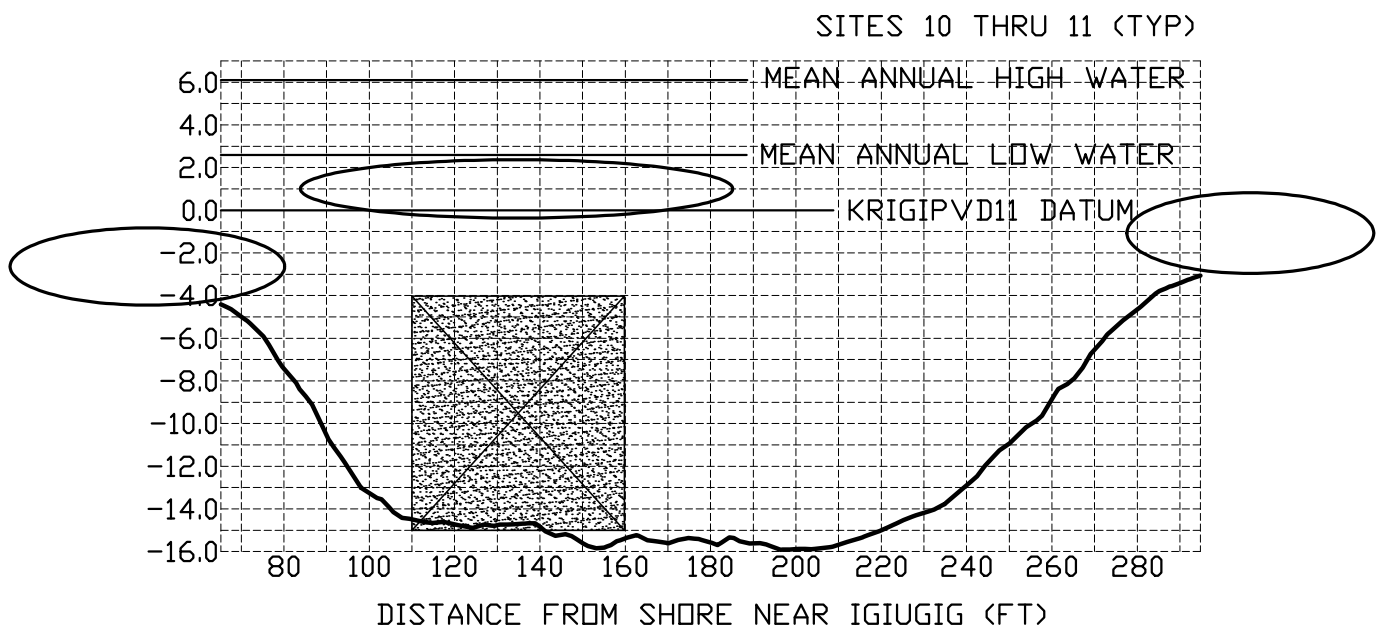
THE IMAGE IS LOOKING DOWNSTREAM, WITH THE VILLAGE ON THE LEFT SIDE OF THE PAGE.

THE BOX REPRESENTS THE MAXIMUM CROSS SECTION OF A DEPLOYED SUBSURFACE DEVICE.

OVALS ON THE OUTSIDE OF THE THALWEG REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION.

OVAL IN THE UPPER THALWEG REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION.

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**1**  
**SH6** AREA 10 TYP SUBSURFACE DEPLOYMENT  
NO SCALE

PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>	
WATERBODY:	<b>KVICHAK RIVER</b>	
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>	
PREPARED BY:	DATE:	SHEET
<b>ALASKA ENERGY AND ENGINEERING, INC</b> P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	<b>3/16/12</b>	<b>SH6 of 9</b>

## NOTES

LOW WATER OCCURS DURING SPRING, HIGH WATER OCCURS DURING FALL.

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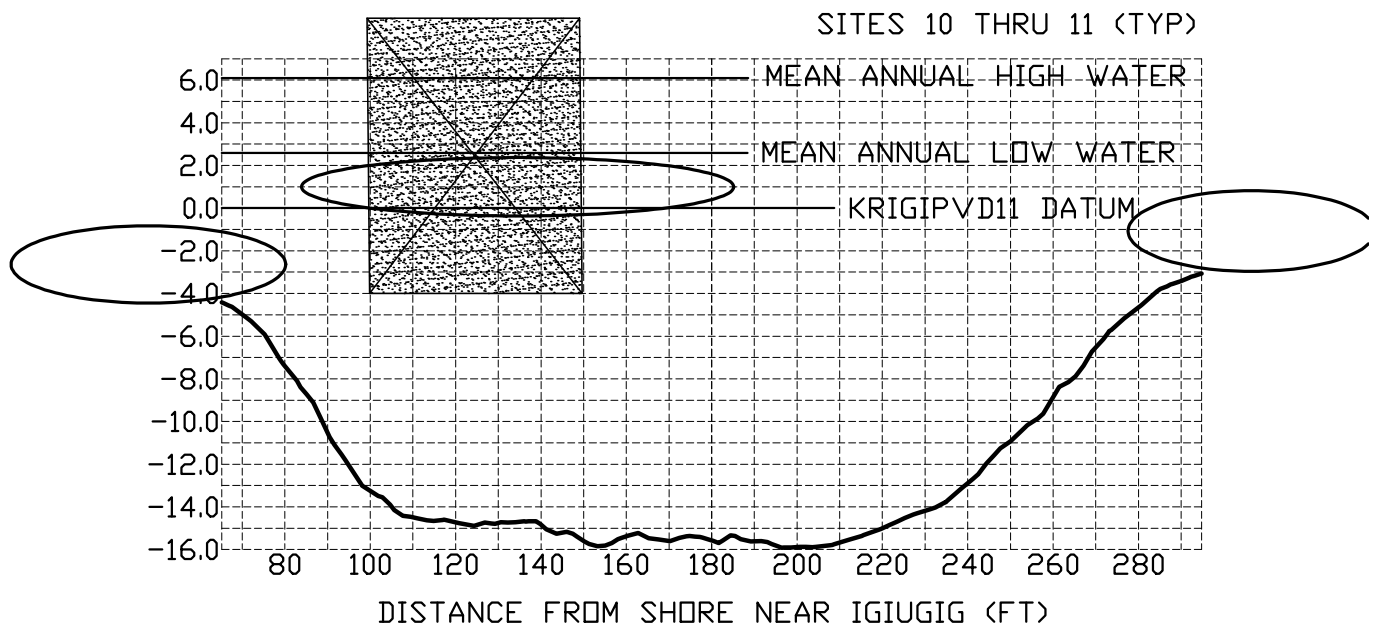
THE IMAGE IS LOOKING DOWNSTREAM, WITH THE VILLAGE ON THE LEFT SIDE OF THE PAGE.

THE BOX REPRESENTS THE MAXIMUM CROSS SECTION OF A DEPLOYED SURFACE DEVICE AT MEAN ANNUAL HIGH WATER.

OVALS ON THE OUTSIDE OF THE THALWEG REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION.

OVAL IN THE UPPER THALWEG REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION.

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**1**  
**SH7** AREA 10 TYP SURFACE DEPLOYMENT  
NO SCALE

PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>	
WATERBODY:	<b>KVICHAK RIVER</b>	
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>	
PREPARED BY:	DATE:	SHEET
<b>ALASKA ENERGY AND ENGINEERING, INC</b> P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	<b>3/16/12</b>	<b>SH7 of 9</b>

## NOTES

LOW WATER OCCURS DURING SPRING, HIGH WATER OCCURS DURING FALL.

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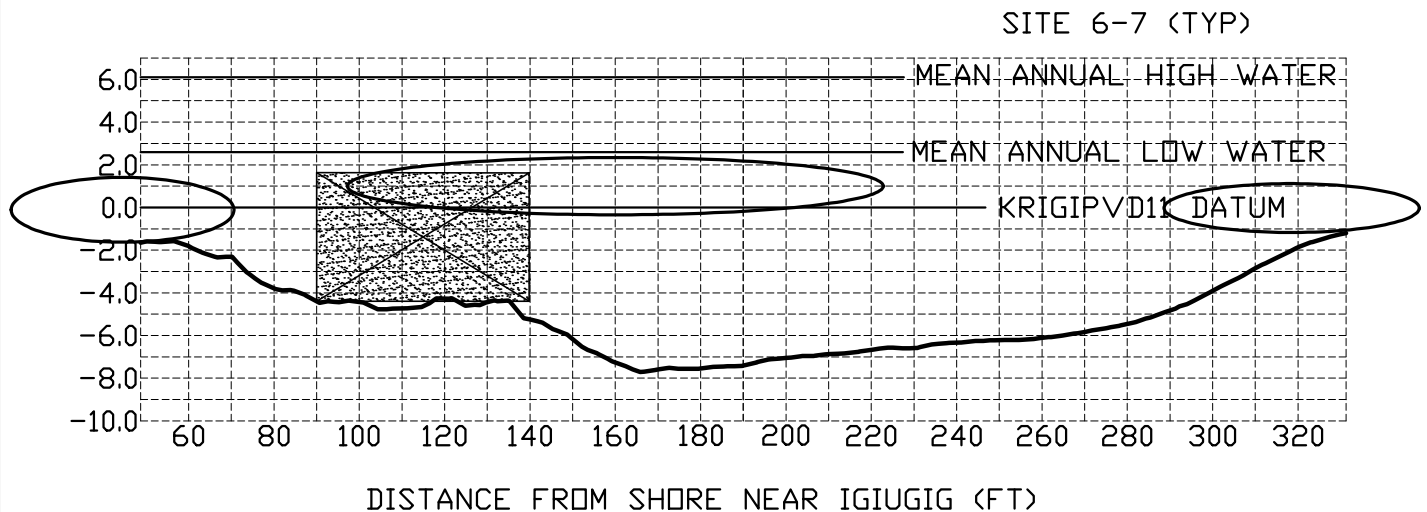
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THE BOX REPRESENTS THE MAXIMUM CROSS SECTION OF A DEPLOYED SUBSURFACE DEVICE.

OVALS ON THE OUTSIDE OF THE THALWEG REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION.

OVAL IN THE UPPER THALWEG REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION.

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**1**  
**SH8** AREA 6 TYP SUBSURFACE DEPLOYMENT  
NO SCALE

PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>		
WATERBODY:	<b>KVICHAK RIVER</b>		
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>		
PREPARED BY:	<b>ALASKA ENERGY AND ENGINEERING, INC</b> P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE:	<b>3/16/12</b>
		SHEET	<b>SH8</b> of 9



## NOTES

LOW WATER OCCURS DURING SPRING, HIGH WATER OCCURS DURING FALL.

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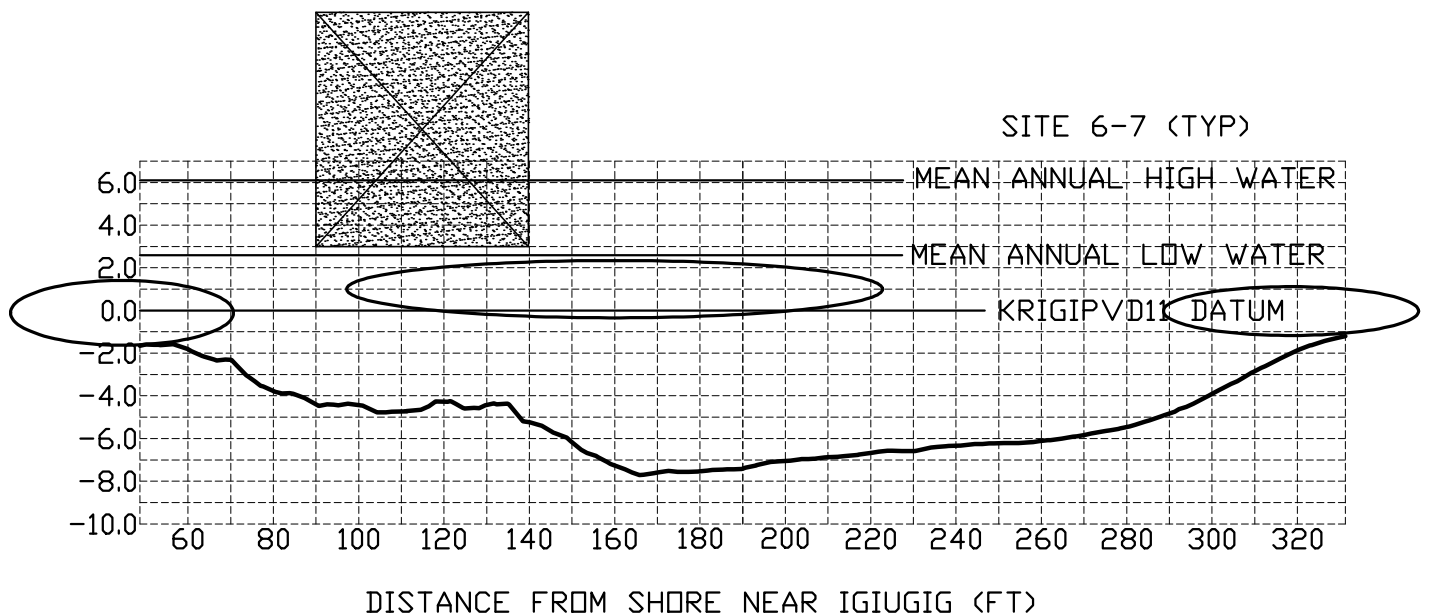
THE IMAGE IS LOOKING DOWNSTREAM, WITH THE VILLAGE ON THE LEFT SIDE OF THE PAGE.

THE BOX REPRESENTS THE MAXIMUM CROSS SECTION OF A TYPICAL DEPLOYED SURFACE DEVICE AT MEAN ANNUAL HIGH WATER.

OVALS ON THE OUTSIDE OF THE THALWEG REPRESENT APPROXIMATE CORRIDOR FOR RETURNING ADULT SALMON UPSTREAM MIGRATION.

OVAL IN THE UPPER THALWEG REPRESENTS APPROXIMATE CORRIDOR FOR SALMON SMOLT OUT-MIGRATION.

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**1**  
**SH9** AREA 6 TYP SURFACE DEPLOYMENT  
NO SCALE

PURPOSE:	<b>KVICHAK RIVER RISEC PROJECT SITE DESCRIPTION</b>	
WATERBODY:	<b>KVICHAK RIVER</b>	
LOCATION:	<b>IGIUGIG LAKE AND PENINSULA BOROUGH</b>	
PREPARED BY:	ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405	DATE: <b>3/16/12</b>
		SHEET <b>SH9</b> of 9